B-Layer and Thermal Barrier

3-February, 2000

Mechanics

E. Anderssen, LBNL

Stages

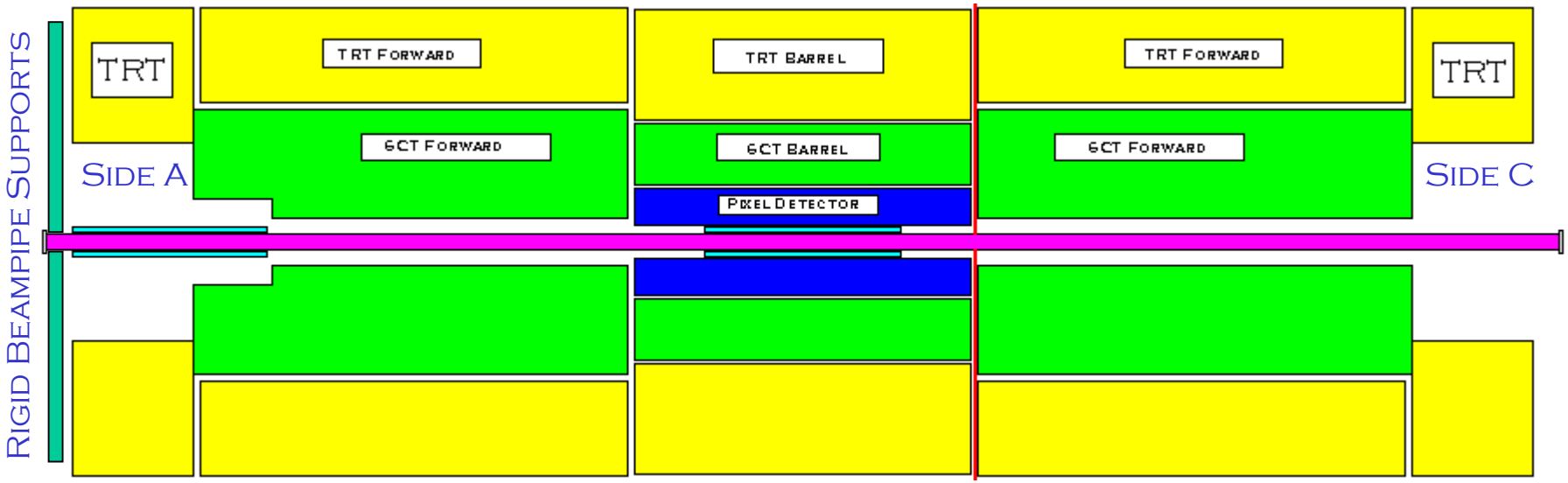
- **End Plate Stiffener**
  - Layout
    - Integrate with Frame
    - Integrate with Services
    - Integrate with Thermal Barrier
  - Detail Design and Analysis
    - Involves detail design of termination to frame and to thermal Barrier
- **B-Layer**
  - Support
    - Integration with Detail design of End Plate Stiffener
    - Tie into modeling effort of Global Support Frame
  - Installation Tooling
    - Detail Rail Cross Section, entry and transition pieces
    - Define interface with SCT Forward thermal Barrier
    - Develop Full Scenario for Installation
- **Thermal Barrier**
  - Integration with support structure
    - Ties into B-Layer Support
    - Develop unstiff connection to End-plate Stiffener
    - Model and Test thermal Performance

Progress

- **Design Effort has temporarily stagnated**
  - Effort has focused primarily on service layout as this greatly affects the termination of End-cap stiffener to Global Support Frame
  - Able to recently investigate service routing at end of frame and look at interaction of End-Plate with services
  - Can Begin to move toward End-Plate design to attach thermal barrier to
- **Definition of SCT Forward Thermal Barrier Dimensions**
  - Asked to study acceptable dimensions for SCT Forward thermal Barrier
  - Arrived at compromise solution suitable for both SCT and Pixels
  - Need to propose design of rail in forward SCT for evaluation by SCT Engineers

Pixel Detector

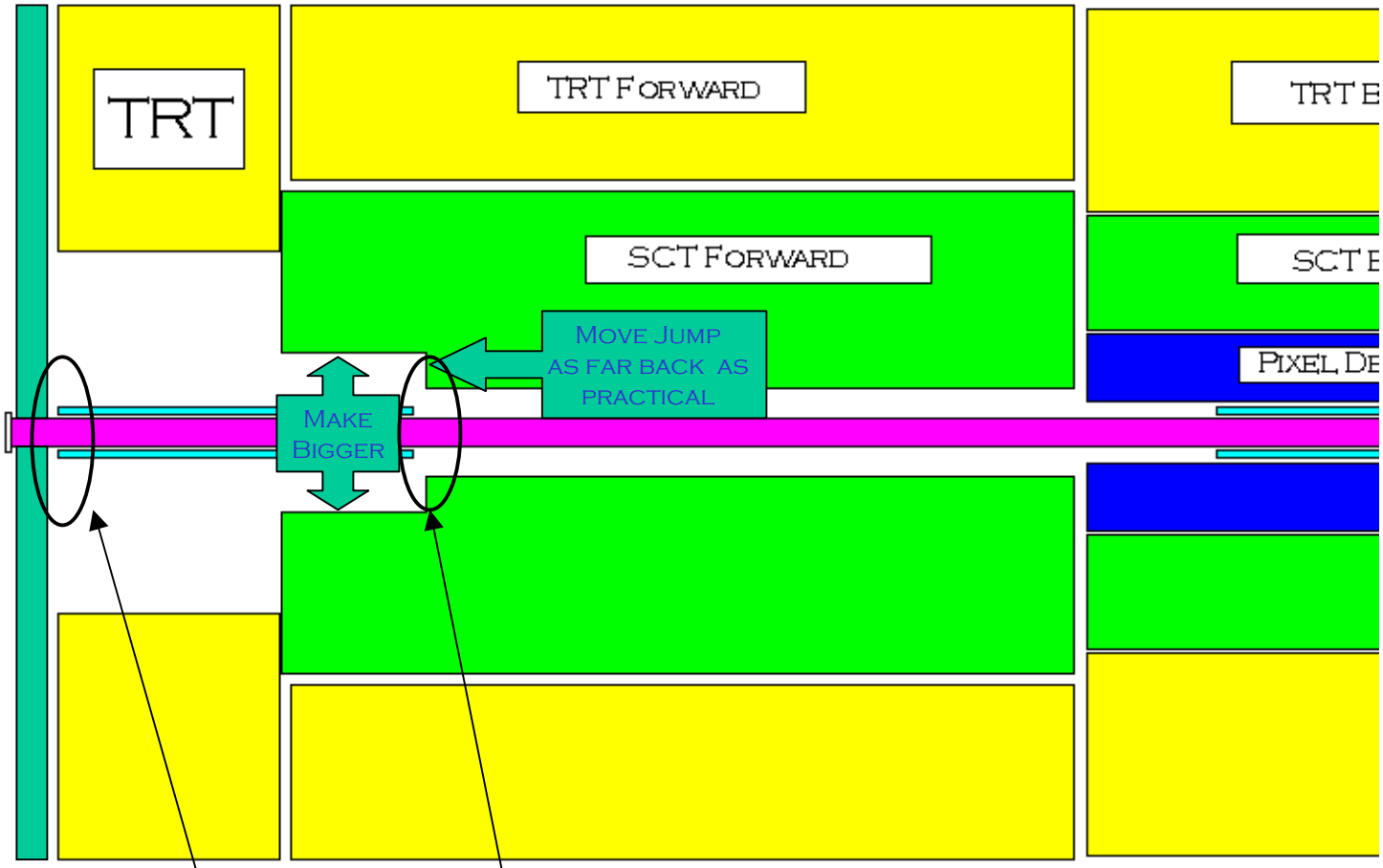
B-Layer Installation



- **B-Layer Installed from Side A**
- **On Side C:**
  - SCT Forward Thermal Barrier can be single diameter (R110)
- **On Side A:**
  - Can reduce to requested 110mm radius over extended length, but request Larger Radius access at end
- **It is most straightforward to install the B-Layer if there is sufficient room to work on its full length when installed over the beampipe**

Pixel Detector

Important Dimensions

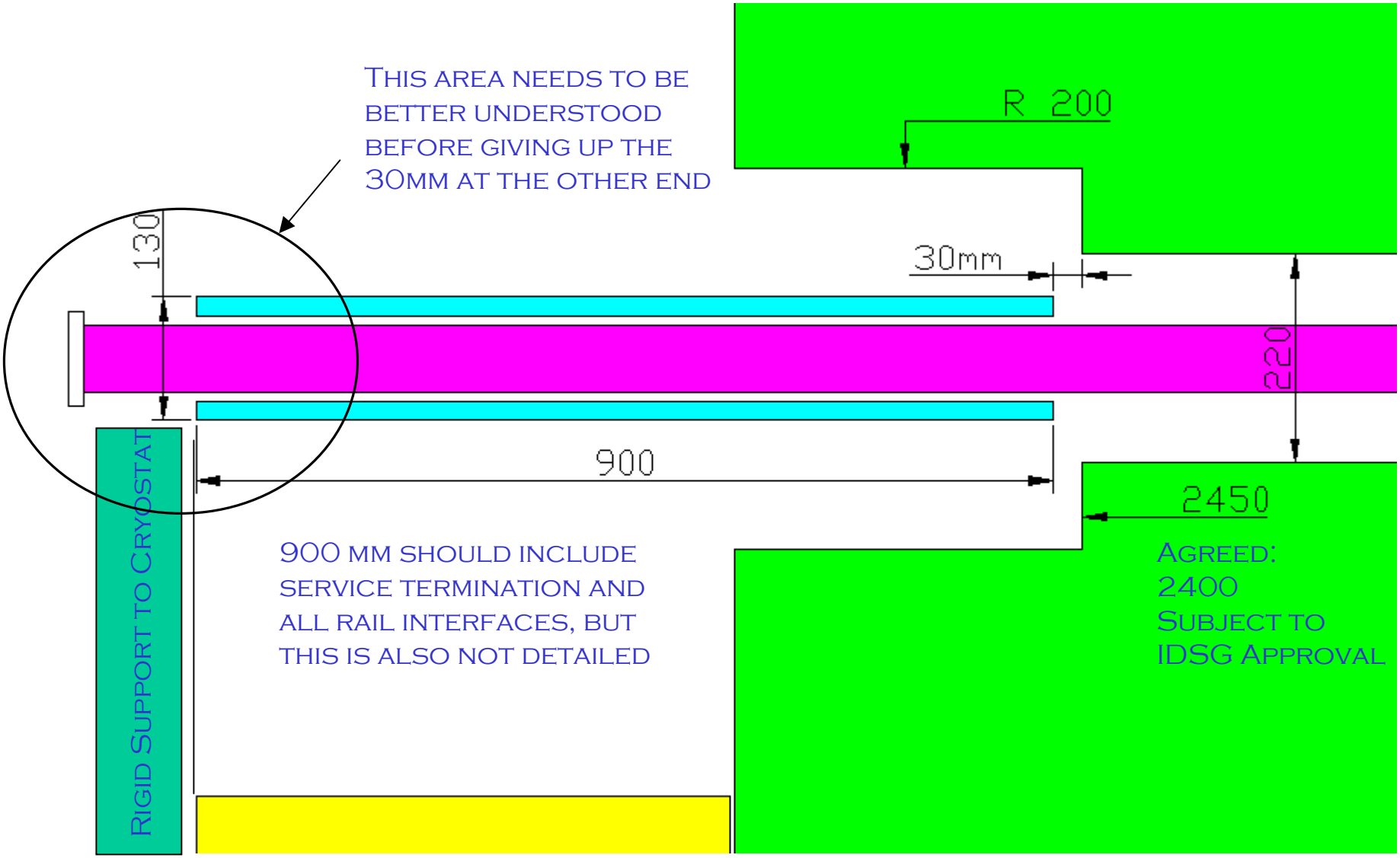


Assuming 900mm B-Layer length, leaves 30mm

Mount not detailed yet, but assume will not extend into TRT Bore

Pixel Detector

Detail of region



Relevant Comments

- **110mm OK for Side C and most of Side A**
  - smaller is probably ok, but
  - Need to check that this is OK with the material people
- **Z of 2400 seems to be a reasonable location to step up the diameter (this was 2150 in the last layout)**
  - Allows B-Layer to fit between Jump and Beampipe support with 80mm clearance
  - We should not reduce this if possible
- **If the 2400 dimension is adopted, we should maximize the radius in this region subject to internal constraints (SCT Alignment paths)**
  - At this stage it is desirable to maximize space for either hands or tooling
  - Should set limit at that acceptable for the Alignment grid
    - This was how r-170 at z-2150 was set

Interface Issues

- **SCT Thermal Barrier**
  - Agreed without defined scope to have supported rail in SCT forward
  - Need to firm up scope and requirements of agreement with SCT
- **Beam-pipe Supports at End of ID**
  - Only off-the-cuff designs exist for this
  - Need to understand shape near beam axis to determine assembly procedure outside of ID
- **Length and Style of Service Termination to B-Layer**
  - Not on critical path compared to barrel services, but…
  - Need to flesh out concepts or extend Barrel Service concepts to B-Layer before defining assembly procedure